

female without being attracted in this way.

Females of *Samia cynthia* do not protrude the ovipositor as much as do the other Attacine moths, and are far

less passive, flying about in as much excitement as the males, and vibrating their wings faster and faster when not flying, quivering all over, and waving their wings in a peculiar manner.

LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE. — XXIII

BY HARRISON G. DYAR, WASHINGTON, D. C.

Nanthotype crocataria Fab. The larva and pupa of this species have been described by Packard, Bowles, French and Forbes, but no complete life-history has been given.

Egg. Laid in patches of six to twenty. Elliptical, flattened, concave on two sides but rounded, wedge shaped from side view, the thick end flattened, subtruncate; shagreened by a minute granulation and with traces of hexagonal reticulations which are indicated only, chiefly by the minute bordering pores which appear as white specks in certain lights. Shining light green. Size $.7 \times .5 \times .3$ mm. Later turning rather dark red.

Stage I. Head rounded, slightly bilobed, pale brownish ochreous, a narrow dark line on the posterior angles, not shining, ocelli black; width .3 mm. Body moderate, normal; white, subdorsal and medioventral purple-brown bands, moderate, straight, reaching from joint 2 to 13, the subdorsals a little divergent on joints 2 and 13. Tubercles and setae minute, dark, inconspicuous. Feet pale outwardly; segments faintly annulate, uniform, incisures not marked. Shields concolorous, not cornified. On eating, the color became greenish from the food showing by transparency.

Stage II. Head erect, rather higher than wide but not above joint 2, pale luteous with a blackish stripe on each side across ocelli to

near vertex, behind which the color is whitish; width .55 mm. Body normal, a little flattened. Dorsum whitish green, a broad red-brown subdorsal stripe, divergent on joints 2 and 13 to the anal feet; sides green, whitish on subventral fold; a ventral stripe like the subdorsal but single, reaching from the head to joint 13. Feet pale; skin smooth.

Stage III. Head rounded, somewhat flattened before and held obliquely flat; pale greenish, obscurely white streaked vertically, the rather large antennae and a stripe on the sides bearing ocelli white, the stripe faintly dark edged before; ocelli black; width .9 mm. Body moderate, normal, a little flattened; anal plate slightly pointed, anal feet triangular, excavate behind with anal prongs which equal the plate. Light green, four white lines in the dorsum; a subdorsal (or rather lateral) band of smoky brown, fainter than before; a greenish white stripe on the subventral fold; subventer faintly white lined, the brown ventral stripe like the subdorsal in color. Feet pale, tubercles and setae small.

Stage IV. Head rounded, squarish, flattened but convex in front, antennae large; held out quite flat; whitish with green tint, obscurely mottled brighter on the sides, a blackish band on the lateral angle forming a bend at antennae to mouth, crossing ocelli;

width 1.2 mm. Body moderately slender, smooth, subventral fold prominent. Whitish green, dorsum with four narrow white lines; lateral band blackish, geminate, reaching joints 2 and 13, but not continued on the anal foot; subventral fold yellowish white, two white lines in the subventral space. Ventral band blackish brown, composed of four fine lines united by a shading. Thoracic feet brown dotted; abdominal foot of joint 10 lined before and behind, that of 13 with triangular plate produced above into a prong. Anal plate triangular, pointed. Spiracles black ringed, that of joint 2 the largest. Tubercles small, ii slightly larger, blackish. Setae short, stiff, dusky.

Stage 1. Head as before, faintly longitudinally streaked with white; lateral band mottled, red-brown, edged with white behind; width 1.9 mm. Body elongate, uniformly yellowish opaque green, shading to whitish green on joints 2 and 13; a faint, more transparent and darker vascular dorsal line showing especially as V-marks between tubercles ii, the point on the posterior edge of the segment. A slightly more opaque subdorsal line below tubercle ii; lateral band reddish brown, obscurely triplicate, nearly obsolete except at the ends, where, especially on joints 10 to 13, it forms a broad diffuse shade; ventral band separated into four lines and obscure except on the thorax between the feet, red-brown. Spiracles white, black edged except on the bottom. Thoracic feet appressed, green, brown dotted. Foot of joint 10 brown bordered. Subventral fold lighter, white posteriorly, running narrowly on the lower part of anal foot. Anal prongs exceeding the triangular plate. There is

occasionally a brown form of the larva which is similar but head and all shaded with vinous brown, darkest in the dorsal V-marks, subdorsal line and ventral region, the pale band on subventral fold contrasted.

Cocoon. Leaves spun together and united by a moderate amount of whitish silk.

Pupa. Bright green, somewhat transparent, the abdomen with a whitish green deposit beneath, leaving a dark green vascular dorsal line. Spiracles, eyes and a small semicircular raised disk on each side of the prothorax behind black. End segment and cremaster also black, the latter a thick cone, densely punctured with a group of recurved hooks at the tip. The last segment is sharply wider than the cremaster and its upper edge is roundedly serrate. Surface smooth and shining.

Food plants various. These larvae fed on several species of *Polygonum*. Double brooded, the second brood hibernating in about the penultimate stage (*Ent. News*, V, 62) and probably having more than five stages as here recorded for the Spring brood. Larvae from Washington, D. C.

HEMIPTERA ON VERBASCUM—It is always interesting to examine introduced plants, and see what native insects have succeeded in utilizing them for food or shelter. Last July at Las Vegas Hot Springs, N. M., I found the European *Verbascum thapsus* growing plentifully, and three species of Hemiptera very much at home upon it. These latter have been submitted to Mr. E. D. Ball, who identifies them as *Thyanta instator* Fabr., *Neides muticus* Say, and *Lygus pratensis* L.
T. D. A. Cockerell.